GOVERNMENT OF INDIA
ATOMIC ENERGY
LOK SABHA

UNSTARRED QUESTION NO:3042
ANSWERED ON:16.03.2016
Thorium Based Reactors
Birla Shri Om

Will the Minister of ATOMIC ENERGY be pleased to state:

(a)whether feasibility studies for thorium based reactors have been conducted by the Government in various parts of the country;

(b)if so, the details thereof, location-wise;

(c)whether India has large reserves of thorium as compared to other countries; and

(d)if so, the details thereof and the total volume of thorium reserves found in the country and total power estimated to be generated through these reserves?

Answer

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (Dr. JITENDRA SINGH):

(a) & (b)Research & Development on Thorium utilisation continues to be a high priority area of the Department of Atomic Energy (DAE). On account of physics characteristics of Thorium, it is however not possible to build a nuclear reactor using Thorium alone. It has to be converted to Uranium-233 in a reactor before it can be used as fuel. With this in view, a three-stage nuclear power programme, based on a closed nuclear fuel cycle has been chalked out to use thorium as a viable and sustainable option, right at the inception of India's nuclear power programme. The three stage nuclear power programme aims to multiply the domestically available fissile resource through the use of natural uranium in Pressurised Heavy Water Reactors, followed by use of plutonium obtained from the spent fuel of Pressurised Heavy Water Reactors in Fast Breeder Reactors. Large scale use of Thorium will subsequently follow making use of the Uranium-233 that will be bred in Fast Breeder Reactors, when adequate capacity has been built in the country. The third stage of Indian nuclear power programme which contemplates making use of Uranium-233 to fuel Thorium Uranium-233 based reactors can provide energy independence to the country for several centuries. All efforts towards technology development and demonstration are being made now, so that a mature technology is available in time.

(c) & (d)Yes, Sir. India has abundant quantity of thorium resources contained in the mineral monazite occurring in the beach sand placer deposits along the eastern and western coasts of the country as well as the inland placers in parts of Kerala, Tamil Nadu, Odisha, Andhra Pradesh, West Bengal, Jharkhand and Chhattisgarh. The Department of Atomic Energy (DAE) through its Atomic Minerals Directorate for Exploration & Research (AMD) has carried out exploration activities over the past six decades, which have resulted in establishing in situ resources of 11.93 million tonnes of monazite as on February 2016 in the country. Indian Monazite contains about 9-10% of Thorium oxide (ThO2) which in turn results in about 1.07 million tonnes of Thorium oxide (ThO2).

A three stage nuclear power programme has been devised to efficiently utilise this large reserve of thorium. The energy potential of this thorium reserve is estimated to be more than 155,500 GWe-years.

*****